CLAIMS

1. Solid comprising a single layer of tungsten oxide on a support of zirconia and/or titanium dioxide, characterised in that the tungsten has tetrahedral coordination before and after calcination.

2. Solid according to claim 1, characterised in that:
a) the tungsten has tetrahedral coordination before and after calcination;
b) the specific surface-area of the solid, after heating to a temperature of less than 800°C, preferably less than 700°C, in particular less than or in the order of 600°C, is between 50 and 300m^2/g, more particularly between 65 and 200m^2/g, advantageously between 86 and 150m^2/g.

3. Solid according to claim 1, characterised in that:
a) the tungsten has a tetrahedral coordination, before and after calcination;
b) the specific surface-area of the solid, after heating to a temperature of less than 800°C, preferably less than 700°C, in particular less than or in the order of 600°C, is between 50 and 300m^2/g, more particularly between 65 and 200m^2/g, advantageously between 86 and 150m^2/g;
c) the solid has a total acidity, measured by means of adsorption of ammonia, of between 0.1 and 0.5mmol/g, preferably between 0.2 and 0.4mmol/g, advantageously approximately 0.35mmol/g of solid, after heating to a temperature of less than 800°C, preferably less than 700°C, in particular less than or in the order of 600°C.

4. Solid according to any one of the preceding claims, characterised in that the quantity of tungsten deposited on

the support is between 0.5% by weight and 80% by weight, advantageously between 1% and 40%, preferably between 2% and 25% by weight relative to the total mass of the support.

5. Solid according to any one of the preceding claims, characterised in that the quantity of tungsten deposited on the support is between 5% by weight and 25% by weight, advantageously between 10% and 25%, preferably between 15% and 25% by weight relative to the total mass of the support.

6. Solid according to any one of the preceding claims, characterised in that the support is a zirconia support.

7. Solid according to any one of the preceding claims, characterised in that it further comprises one or more metals selected from platinum, rhodium, cobalt, palladium, nickel and iron.

8. Solid according to any one of the preceding claims, characterised in that its activation and/or regeneration temperature is less than 800°C, more particularly less then 700°C, advantageously in the order of or less than 600°C.

9. Process for preparing a solid according to any one of the preceding claims, characterised in that a single layer of WO_4^{2-} ions is deposited on a zirconia support.

10. Process according to the preceding claim, characterised in that it comprises the steps of:

a) oxidising tungstic acid into peroxotungstic acid ($H_2W_2O_{11}$);

b) exchanging anions in an acid medium of preferably less than pH 3 between the solution of peroxotungstic acid

obtained in this manner and a hydrated zirconia (ZrO_2) and/or hydrated titanium dioxide (TiO_2) support; and

c) recovering the tungsten/zirconia and/or titanium dioxide solid.

11. Process according to claim 9, characterised in that it comprises the steps of:

a) oxidising hydrated tungsten trioxide (WO_3) in the presence of an oxidation agent;

b) exchanging anions in an acid medium preferably of less than pH 3 between the solution of peroxotungstic acid obtained in this manner and a hydrated zirconia (ZrO_2) and/or titanium dioxide (TiO_2) support; and

c) recovering the tungsten/zirconia and/or titanium dioxide solid.

12. Use of a solid according to any one of claims 1 to 8 as a catalyst for reactions of oxidation, epoxidation, hydrodesulphuration, isomerisation of paraffins and olefins, hydrogenation of aromatic compounds, oxidation of sulphurous compounds or olefins.

13. Use according to claim 12, characterised in that the catalysed reaction is an acid-catalysed reaction.

14. Use according to either claim 12 or 13, characterised in that the reaction is a catalytic oxidation reaction of sulphurous derivatives, in particular those present in hydrocarbons, before or after refinement.

15. Use according to any one of claims 12 to 14 for desulphurising hydrocarbons, in particular fuels, for example, petroleums, kerosenes and gas oils.

16. Use according to any one of claims 12 to 15, characterised in that the reaction is a catalytic oxidation reaction of benzothiophenes and/or dibenzothiophenes, substituted or non-substituted.

17. Process of desulphurisation by oxidising compounds or compositions containing sulphurous compounds, characterised in that it comprises the steps of:

a) bringing the compound or composition to be desulphurised into contact with an oxidising agent and a solid comprising a single layer of tetrahedral tungsten deposited on a zirconia and/or titanium dioxide support;

b) carrying out the oxidation reaction in a suitable solvent, preferably at atmospheric pressure and at a suitable temperature, preferably between 20°C and the boiling temperature of the solvent;

c) removing the oxidation products from the initial compound or composition.

18. Process according to the preceding claim, characterised in that the support is a zirconia support.

19. Process according to either claim 17 or 18, characterised in that the compounds or the compositions to be desulphurised are refined or non-refined products resulting from the distillation of crude petroleum, in particular hydrocarbons and especially fuels, in particular petroleums, kerosenes and gas oils, more specifically gas oils.

20. Process according to any one of claims 17 to 19, characterised in that the compounds are thiophenic

derivatives, in particular benzothiophenes, dibenzothiophenes and their derivatives, in particular substituted.

21. Process according to any one of claims 17 to 20, characterised in that the oxidising agent is selected from the peroxides, in particular hydrogen peroxide or tert-butyl hydroperoxide, these oxidising agents being able to be used alone or in admixture.

22. Process according to any one of claims 17 to 21, characterised in that the solvent of the reaction is selected from the compound or composition to be processed, water, alkanes, alkanols, polar solvents, these solvents being able to be used alone or in admixture.

23. Process according to any one of claims 17 to 22, characterised in that it is carried out in a homogeneous, heterogeneous, monophase, bi-phase or tri-phase medium.

24. Process according to any one of claims 17 to 23, characterised in that the ratio of oxidant/compounds to be oxidised is between 100/1 and 1/100, preferably between 100/1 and 1/1, further preferably between 20/1 and 1/1 and quite particularly between 10/1 and 2/1.

25. Process according to any one of claims 17 to 24, characterised in that the oxidation product is removed from the reaction medium in the course of its formation.

26. Desulphurised fuel which is substantially produced according to the process described in any one of claims 17 to 25.

27. Fuel according to claim 26, characterised in that it is gas oil.